SLOVENSKI STANDARD
SIST ENV 50204:1997

01-marec-1997

Radiated electromagnetic field from digital radio telephones - Immunity test

Radiated electromagnetic field from digital radio telephones - Immunity test

Störfestigkeit gegen hochfrequente elektromagnetische Felder von digitalen Funktelefonen

Essai d'immunité aux émissions RF des radios téléphones numériques

Ta slovenski standard je istoveten z: **ENV 50204:1995**

ICS:

33.050.10	Telefonska oprema	Telephone equipment
33.100.20	Imunost	Immunity

SIST ENV 50204:1997 **en**

EUROPEAN PRESTANDARD

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

ENV 50204

March 1995

English version

Radiated electromagnetic field from digital radio telephones Immunity test

This European Prestandard (ENV) was approved by CENELEC on 1994-12-08 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CENELEC will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard (EN).

CENELEC members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Ref. No. ENV 50204:1995 E

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FOREWORD

This European Pre-standard has been prepared by Working Group 2 of TC110. It was approved by vote at the meeting of TC110 on 1994-12-8.

The standard gives a test method for the immunity of apparatus to electromagnetic fields radiated from digital radio telephones.

The standard is intended to be used for reference as a basic standard in generic and product standards until a corresponding IEC/CENELEC standard (test at 900 MHz and 1,89 GHz) is available, when this ENV will be immediately withdrawn.

The following date has been fixed:

- latest date of announcement of the ENV at national level (doa): 1995-03-31

This document has the status of basic EMC publication, in accordance with IEC Guide 107.

Annexes A and B designated "informative" are given only for information and do not form part of the body of the standard.

ELECTROMAGNETIC COMPATIBILITY (EMC) -

Radiated electromagnetic field from digital radio telephones Immunity test

Basic EMC Publication

1 Scope

The standard relates to the immunity of electrical and electronic equipment to the electromagnetic fields radiated from GSM (Group Special Mobile) and the DECT (Digital European Cordless Telephone) radio systems operating at the frequencies 900 MHz and 1,89 GHz using TDMA (Time Division Multiple Access) techniques.

The object of this standard is to establish a common reference for evaluating by test the performance of apparatus when subjected to this type of radiated electromagnetic field.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.
When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC 68-1:1988, Environmental testing - Part 1: General and guidance.
ENV 50140, Radiated, radio-frequency electromagnetic field - Immunity test.

The document ENV 50140 will be replaced by an EN corresponding to IEC 1000-4-3.

3 General

The electromagnetic fields radiated by digital radio telephones may influence the reliable operation of equipment and systems.

This standard covers equipment which is expected to be used in the vicinity of digital radio telephones operating at frequencies of 900 MHz and 1,89 GHz.

The test method is defined for assessing the impact of radiation on concerned equipment; it is structured for the primary objective of establishing adequate repeatability of results at various test facilities and it is not intended to exactly simulate the modulation characteristics of the actual environment.

The test technique and test procedures used in this standard are the same as for the immunity test "Radiated, radio-frequency electromagnetic field". For this test technique and these test procedures reference is made, in each dedicated clause of this standard, to the ENV 50140.

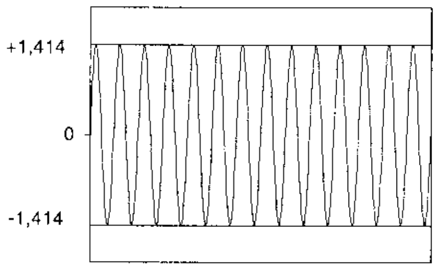
4 Definitions

The definitions given in ENV 50140 apply; in the following, only the definitions related to the modulation used in this test are given.

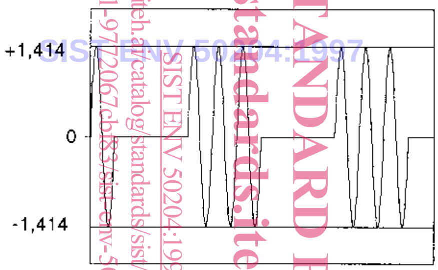
4.1 Keyed carrier: A carrier modulated following the on-off law.

4.2 Duty cycle: The ratio of the time during which the signal is on and the time of one cycle.

Examples of unmodulated carrier and keyed carrier are given in figure 1.



Unmodulated carrier
(Vp-p=2,8 V for 1 Vrms)



Keyed carrier, duty cycle 50 %
(Vp-p=2,8 V for 1 Vrms)

Figure 1 - Examples of unmodulated carrier and keyed carrier.

5 Test levels

The preferred range of test levels is given in table 1.

Table 1 - Test levels

Level	Test field strength V/m
1	1
2	3
3	10
4	30
x	special
NOTE - x is an open level. This level may be given in the product specification	

The test signal is a carrier at spot frequencies of 900 MHz ± 5 MHz and 1,89 GHz ± 10 MHz keyed at frequency 200 Hz ± 1 %, 50 % duty cycle (2,5 ms on and 2,5 ms off).

The rationale for the choice of the carrier keyed at 200 Hz is given in annex A.
A guidance for the selection of the test levels is given in annex B.

6 Test equipment

The relevant specifications of clause 6 of ENV 50140 apply, with the following additional specifications:

"The radio-frequency generator shall have a frequency range up to the specified test spot frequencies and with keying capability at 200 Hz, 50 % duty cycle."

and

"The field generating antenna shall be a Log periodic antenna or any other linearly polarized antenna system capable of satisfying the frequency requirements."

6.2 *Calibration of field*

The relevant specifications given in subclause 6.2 of ENV 50140 apply, with the following additional specification:

"The calibration of the field shall be carried out at the specified spot frequencies."

7 Test set-up

The relevant specifications given in clause 7, subclause 7.1, subclauses 7.2 and 7.3 of ENV 50140 apply, with the following additional specifications:

"Body mounted equipment shall be tested in the same manner as table top items, unless another set-up is given in the product specification."

"NOTE - Body mounted equipment tested as specified above may be overtested because the absorption characteristics of the human body are not taken into account (human body simulator is under consideration)."

8 Test procedure

The relevant specifications given in clause 8 of ENV 50140 apply, with the following additional specifications:

"The test shall be carried out at the specified spot frequencies using horizontal and vertical antenna polarization."

and

"The carrier shall be keyed (on-off) at 200 Hz frequency and 50 % duty cycle (2,5 ms on and 2,5 ms off)."

9 Test results and test report

The specifications given in clause 9 of ENV 50140 apply.

ANNEX A

(informative)

Rationale for the choice of the carrier keyed at 200 Hz

Radio telephone systems often use time division multiple access techniques (TDMA) for sharing the same carrier frequency. In TDMA systems, the information is transmitted in "bursts" during assigned time slots. Usually, during the burst the RF amplitude is constant and the RF carrier is frequency or phase modulated.
The power in the burst is called "peak power" and the field strength associated with it is the "peak field strength".
Note that this peak field strength is the root mean square (RMS) of the field during the burst.

Some of the TDMA systems in operation use modulations as given below:

GSM:	pulsed RF, modulation frequency 200 Hz with duty cycle 12 % (1:8);
DECT (Base station):	pulsed RF, modulation frequency 100 Hz with duty cycle 50 % (1:2);
DECT (portable):	pulsed RF, modulation frequency 100 Hz with duty cycle 4 % (1:24).

In order to simplify the test, the 200 Hz frequency for keying the carrier and the 50 % duty cycle have been selected.